

### REMARKS/ARGUMENTS

Claims 1, and 3-24 are pending. By this amendment, claims 3-5 are amended. No new matter is introduced. Reconsideration and allowance of the claims in view of the above amendments and the remarks that follow are respectfully requested.

Entry of the above amendments is proper under 37 C.F.R. § 1.116 because the amendments (1) place the claims in better form for appeal if needed; and (2) do not introduce any elements requiring further search by the Examiner.

#### Claim Objections

Claims 3-5 are objected to because they depend from the canceled claim 2. Claims 3-5 have been amended to correct the dependency. Applicants respectfully submit that the ground for objection has been obviated and withdrawal of the objection is respectfully requested.

#### Rejections Under 35 U.S.C. § 103

Claims 1, 3-7, 9, 14-17, 22 and 23 stand rejected under 35 U.S.C. § 103(a) over Higuchi in view of U.S. Patent No. 5,869,916 to Suzuki et al. (hereinafter “Suzuki-916”) for reasons stated on page 3 of the Office Action. Applicants respectfully traverse these rejections.

To establish a *prima facie* case of obviousness ... the prior art reference (or references when combined) must teach or suggest all of the claim limitations. *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991) and MPEP § 2142. In order to combine references, the following tenets of patent law must be adhered to: (A) The claimed invention must be considered as a whole; (B) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination; (C) The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention, and (D) Reasonable expectation of success is the standard with which obviousness is determined. *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n.5 (Fed. Cir. 1986).

Independent claims 1, 14 and 22 of the present invention relate to an electrostatic comb drive actuator comprising, among other things, voltage sources that impose discrete voltage patterns on the first and the second electrodes (claims 1 and 22), or electrode arrays (claim 14).

The Examiner asserts that Higuchi teaches every aspect of the claimed invention except the discrete voltage patterns and intermediate voltage, and that Suzuki-916 teaches a DC (discrete) driving voltage and an intermediate driving voltage to smooth the movement of the mover (Figure 9). The Examiner then concludes that “[i]t would have been obvious to a

person of ordinary skill in the art at the time of the invention to construct the actuator of Higuchi with the intermediate driving voltages of Suzuki-916 to provide a smooth movement of the mover. Applicants respectfully disagree.

Suzuki-916 describes an electrostatic actuator having electrodes formed on a movable element and on a stator element. The electrodes of the movable element and the stator element are connected together at every other electrode to provide two phases for the movable element and the stator element, respectively. The electrodes of the movable element are applied with a voltage of fixed polarity, while the electrodes of the stator element are applied with a voltage of switched-over polarity. In order to smooth the transition between the switching polarity on the stator electrodes, Suzuki-916 describes using intermediate voltages as the driving force acting on the movable element to smooth the movement of the movable element (col. 8, lines 56-59).

Higuchi generally describes electrostatic actuators that contain electrodes formed at regular pitches on stators and rotors. The actuators are conventional layered-type actuators driven by three-phase-circuit AC voltages. As is well understood by one skilled in the art, the AC voltages provide driving voltages that change in a continuous fashion. In other words, the actuators of Higuchi are driven by a high voltage, a low voltage, and a large number of intermediate voltages. There is no need to use a discrete driving voltage pattern with a few intermediate voltages, such as the voltage pattern described in Suzuki-916, to “smooth movement of the mover.” Moreover, Higuchi is designed specifically to use conventional three-phase AC voltages (see e.g., paragraph 0001, Field of Industrial Application). It would have been obvious to a person of ordinary skill in the art that replacing the three-phase AC driving voltage with discrete DC voltages of Suzuki-916 would render Higuchi’s invention inoperable in its intended industrial field. Accordingly, Applicants respectfully submit that, when viewed without the benefit of impermissible hindsight afforded by the claimed invention, Higuchi fails to suggest the desirability and thus the obviousness of making the combination.

In addition, even if a person of ordinary skill in the art tries to combine Higuchi with Suzuki-916, there would be no reasonable expectation of success. As discussed above, replacing the three-phase AC driving voltage of Higuchi with the discrete DC voltages of Suzuki-916 would effectively render Higuchi’s invention inoperable in its intended industrial field.

Accordingly, Applicants respectfully submit that Higuchi and Suzuki-916, individually or in combination, do not render claims 1, 14 and 22 obvious. Applicants further

submit that claims 3-7, 9, 15-17 and 23 are patentable over Higuchi and Suzuki-916, because they depend from claims 1, 14 and 22 and define additional patentable subject matter. Withdrawal of the 35 U.S.C. § 103(a) rejection to Claims 1, 3-7, 9, 14-17, 22 and 23 is respectfully requested.

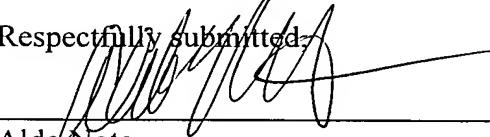
Claims 8, 10-12, and 18-21 stand rejected under 35 U.S.C. § 103(a) over Higuchi and Suzuki-916, and further in view of Japanese Patent No. 08-186987 to Suzuki et al. (hereinafter “Suzuki-987”) for reasons stated on page 4 of the Office Action. Claims 13 and 24 stand rejected under 35 U.S.C. § 103(a) over Higuchi and Suzuki-916, and further in view of U.S. Patent No. 5,986,381 to Hoen et al. (hereinafter “Hoen”) for reasons stated on page 5 of the Office Action. Applicants respectfully traverse the rejections.

Claims 8, 10-13, 18-21, and 24 depend from independent claims 1, 14 and 22. As discussed above, Higuchi and Suzuki-916 do not render claims 1, 14 and 22 obvious. Applicants respectfully submit that Suzuki-987 and Hoen do not cure the deficiency of Higuchi and Suzuki-916. Specifically, a person of ordinary skill in the art would recognize that there would be no desirability to combine Suzuki-987 or Hoen with Higuchi, as suggested by the Examiner. For example, Suzuki-987 is cited for the teaching of connecting every other electrode to a conductor. Applying this connection pattern to Higuchi would render Higuchi’s invention inoperable, since Higuchi is specifically designed to use three-phase-circuit AC voltages. Hoen is cited for teaching flexure suspension compliant in one direction and stiff in the direction orthogonal to travel. Such a suspension, which is commonly used for MEMS actuators, simply does not apply to the large, conventional layered-type actuators described by Higuchi. Accordingly, Applicants respectfully submit that Higuchi, Suzuki-916, Suzuki-987, and Hoen, individually or in combination, do not render claims 1, 14 and 22 obvious. Applicants further submit that claims 8, 10-13, 18-21, and 24 are patentable over Higuchi, Suzuki-916, Suzuki-987, and Hoen because they depend from claims 1, 14 and 22 and define additional patentable subject matter.

In view of the foregoing remarks, favorable reconsideration of all pending claims is requested. Applicants respectfully submit that this application is in condition for allowance and request that a notice of allowance be issued. Should the Examiner believe that anything further is required to expedite the prosecution of this application or further clarify the issues, the Examiner is requested to contact Applicants' attorney at the telephone number listed below.

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Respectfully submitted,

  
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